AMENDMENTS

IN THE CLAIMS

1. (original) A method for traffic shaping in a computer network, the method comprising:

receiving at least one data packet on a traffic manager from a user network entity;

calculating at least one flow control parameter using the at least one data packet received from the user network entity;

comparing the at least one flow control parameter to at least three threshold levels comprising at least a committed threshold level, a control threshold level and a peak threshold level; and

applying a link layer control mechanism to control data flow from the user network entity if a value of the at least one flow control parameter is between the committed threshold level and the control threshold level.

2. (original) A computer readable medium having stored therein instructions to execute the method of claim 1.

3. (original) The method of claim 1, further comprising the steps of:

applying a data drop algorithm to the at least one data packet if the value of the at least one flow control parameter is between the control threshold level and the peak threshold level; and

dropping the at least one data packet if the value of the at least one flow control parameter exceeds the peak threshold level.

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4. (original) The method of claim 3, further comprising the steps of:

calculating a packet drop probability using the data drop algorithm and the value of the at least one flow control parameters; and

dropping the at least one data packet based on the packet drop probability.

5. (original) The method of claim 1, wherein the step of computing the at least one flow control parameter comprises computing a data packet rate on a traffic shaper entity receiving the at least one data packet via an input interface connected to the user network entity via a communication link.

6. (original) The method of claim 1, further comprising the step of storing a plurality of user profile records on the traffic manager, wherein each user profile record comprises at least three user-specific threshold levels.

7. (original) The level of claim 1, wherein the step of applying a link layer mechanism to control data flow from the user network entity comprises controlling a transmit slot allocation for data transmission from the user network entity on the traffic manager.

8. (original) The method of claim 1, wherein the computer network comprises a data-over-cable network, the traffic manager is at a cable network headend, and the user network entity comprises a cable modem transmitting the at least one data packet from a customer premises equipment entity.

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9. (original) The method of claim 1, further comprising the step of employing an Explicit Congestion Notification (ECN) mechanism if the at least one flow control parameter is between the committed threshold level and the control threshold level.

10. (cancelled without prejudice) The method of claim 1, further comprising the step of employing an Explicit Forward Congestion Indication (EFCI) mechanism if the at least one flow control parameter is between the committed threshold level and the control threshold level.

11. (original) A method for congestion avoidance in a computer network, the method comprising:

receiving at least one data packet on a traffic manager from a user network entity;

calculating at least one congestion avoidance control parameter using the at least one data packet received from the user network entity;

comparing the at least one congestion avoidance control parameter to at least three threshold levels comprising at least a committed threshold level, a control threshold level, and a peak threshold level;

applying a link layer mechanism to control data flow from the user network entity if a value of the at least one congestion avoidance control parameter is between the committed threshold level and the control threshold level.

12. (original) A computer readable medium having stored therein instructions to execute the method of claim 11.

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13. (original) The method of claim 11, further comprising the steps of:

applying a data drop algorithm to the at least one data packet if the value of the at least one congestion avoidance parameter is between the control threshold level and the peak threshold level; and

dropping the at least one data packet if the value of the at least one congestion avoidance control parameter exceeds the peak threshold level.

14. (original) The method of claim 13, further comprising the steps of:

calculating a packet drop probability using the data drop algorithm and the value of the at least one congestion avoidance parameter; and

dropping the at least one data packet based on the packet drop probability.

15. (original) The method of claim 11, wherein the step of computing the at least one congestion avoidance parameter comprises computing an average queue size on an output interface prior to forwarding the at least one data packet to an external network.

16. (original) A method for traffic shaping in a data-over-cable system, the method comprising:

receiving at least one data packet on a traffic manager from a cable modem associated with a predetermined customer premises equipment sending the at least one data packet;

calculating at least one flow control parameter using the at least one data packet received from the cable modem;

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comparing the at least one flow control parameter to at least three flow control threshold levels comprising at least a committed threshold level, a control threshold level and a peak threshold level;

controlling a bandwidth allocation for upstream transmission from the cable modem if a value of the at least one flow control parameter is between the committed threshold level and the control threshold level.

17. (original) A computer readable medium having stored therein instructions to execute the method of claim 16.

18. (original) The method of claim 16, wherein the traffic manager comprises a traffic shaper connected to an input interface of a headend network entity receiving the at least one data packet on an upstream connection from the cable modem, the traffic shaper calculating the at least one flow control parameter comprising a packet arrival rate on the input interface and comparing the packet arrival rate to at least three packet arrival rate threshold levels.

19. (original) The method of claim 16, wherein the traffic manager comprises a traffic conditioner connected to an output interface of a headend network entity, the traffic conditioner calculating the at least one flow control parameter comprising an average queue size of the output interface and comprising the queue size to at least three queue size threshold levels.

20. (original) The method of claim 16, wherein the traffic manager comprises a traffic shaper connected to an input interface of a cable modem termination system, and a traffic

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conditioner connected to an output interface of the cable modem termination system, the traffic shaper calculating a packet arrival rate and the traffic conditioner calculating a queue size on the output interface.

21. (original) The method of claim 16, wherein the step of controlling a bandwidth allocation for upstream transmission from the cable modem further comprises the step of using a bandwidth allocation MAP.

22. (original) The method of claim 21, wherein the step of using the bandwidth allocation MAP further comprises the step of not reserving bandwidth for upstream transmission from the cable modem.

23. (original) The method of claim 22, further comprising the step of allocating the bandwidth not allocated for the cable modem to a second cable modem.

24. (original) The method of claim 16, further comprising the steps of:

applying a data drop algorithm to calculate a packet drop probability if the at least one flow control parameter value is between the control threshold level and the committed threshold level; and

dropping the at least one data packet received from the cable modem based on the calculated packet drop probability.

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25. (original) The method of claim 16, further including the steps of dropping the at least one data packet received from the cable modem if the at least one flow control parameter value exceeds the peak threshold level.

26. (original) A system for traffic shaping in a computer network, the system comprising:

an input interface arranged to receive at least one data packet from a network entity via an upstream communication link;

an output interface arranged to send the at least one data packet to an outside network;

a traffic manager connected to the input interface and the output interface, the traffic manager arranged to calculate at least one flow control parameter using the at least one data packet received from the network entity and compare the flow control parameter to a set of flow control threshold levels comprising a committed threshold level, a control threshold level and a peak threshold level, the traffic manager further arranged to apply a flow control mechanism to control data flow from the network entity if a value of the at least one flow control parameter falls between the committed threshold level and the control threshold level.

27. (original) The system of claim 26, wherein the traffic manager is connected to the input interface on a cable modem termination system.

28. (original) The system of claim 26, wherein the traffic manager comprises a traffic shaper connected to the input interface, the traffic shaper arranged to calculate the at least one flow control parameter comprising a packet arrival rate on the input interface and compare

the packet arrival rate to the set of flow control threshold levels comprising a committed packet rate threshold level, a control packet rate threshold level and a peak packet rate threshold level.

29. (original) The system of claim 28, wherein the traffic manager further comprises a traffic conditioner connected to the output interface, the traffic conditioner arranged to calculate the at least one flow control parameters comprising an average queue size on the output interface and compare the calculated queue size to the set of flow control threshold levels comprising a committed queue size threshold level, a control queue size threshold level and a peak queue size threshold level.

30. (original) The system of claim 26, wherein the flow control mechanism comprises a link-layer control mechanism.

31. (original) The system of claim 30, wherein the link-layer control mechanism comprises a bandwidth allocation mechanism for controlling upstream transmission from the network entity via the upstream communication link.

32. (original) The system of claim 31, wherein the bandwidth allocation mechanism comprises a bandwidth allocation MAP generated for the network entity.

33. (original) The system of claim 26, wherein the traffic manager determines a packet drop probability if a value of the at least one flow control parameter falls between the

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control threshold level and the peak threshold level, and drops the at least one data packet based on the calculated drop probability.

34. (original) The system of claim 26, wherein the traffic manager drops the at least one data packet if a value of the at least one flow control parameter is greater than the peak threshold level.

35. (original) The system of claim 26, wherein the flow control mechanism comprises an Explicit Congestion Notification (ECN) mechanism.

36. (original) The system of claim 26, wherein the flow control mechanism comprises an Explicit Congestion Indication mechanism or a Forward Explicit Congestion Notification mechanism.

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